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ABSTRACT

This study attempts to account for the distributional restrictions of Japanese head-internal relative clauses, and the restrictions on accessibility of noun phrases to head internal relativization in terms of the Empty Category Principle (ECP). The data indicate that there is a subject/object asymmetry in the distribution of the head - internal relative clauses, suggesting an account by the ECP. Head-internal relatives also have a curious restriction on the accessibility of the noun phrase to relativization. (MSE)

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Head-Internal Relative Clauses in Japanese

by

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HEAD-INTERNAL RELATIVE CLAUSES IN JAPANESE

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1. Introduction

In addition to normal headed (or head-external) relative clauses, Japanese has so-called head-internal relative clauses, where the head NP is contained in a relative clause on the surface, as illustrated in (1).[1]

(1) keikan-ga [doroboo-ga heya-kara detekita no]-o
policeman-NOM thief-NOM room-from came out -ACC

taiho-shita (koto)
arrested (fact) (no = complementizer)

'The policeman arrested the thief who came out of the room'

Compare (1) with (1'), which is a headed (or head-external) relative corresponding to (1).

(1') keikan-ga [[heya-kara detekita] doroboo]-o
policeman-NOM room-from came out thief -ACC

taiho-shita (koto)
arrested (fact)

As we will see below, there is a subject/object asymmetry in the distribution of head-internal relative clauses, which suggests an account by the Empty Category Principle (ECP). Assuming that an ECP account is on the right track, in Section 2, I will consider what the construction in (1) can say about the nature of the ECP. Head-internal relatives also have a curious restriction on the accessibility of NP to relativization. In Section 3, I will claim that LF movement of I(nfl) into N (as X^0 movement), along with SPEC-head agreement in IP and feature transmission via coindexing, plays a crucial role in accounting for this phenomenon.[2]

2. Distributional Restrictions

The distribution of head-internal relative clauses is very restricted. They can only occur in the direct object position of a verb, either with accusative Case as in (2a) or with dative Case as in (2b).

(2) a. keikan-ga [doroboo-ga heya-kara detekita no]-o
policeman-NOM thief-NOM room-from came out -ACC

taiho-shita (koto)
arreste d (fact)

'The policeman arrested the thief who came out of the room'

b. keikan-ga [doroboo-ga heya-kara detekita no]-ni
policeman-NOM thief-NOM room-from came out -DAT

butsukatta (koto)
bumped into (fact)

'The policeman bumped into the thief who came out of the room'

Head-internal relatives cannot occur in subject position as in (3) or in indirect object position as in (4).

(3) ?*[doroboo-ga hooseki-o hakobidashiteiru no]-ga tsumazuita
thief-NOM jewelry-ACC was carrying -NOM stumbled

'The thief who was carrying the jewelry stumbled'

(4) ?*John-ga hagemashi-no tegami-o [otoko-ga ochikondeiru
John-NOM encouragement-GEN letter-ACC man-NOM depressed

no]-ni okutta (koto)
-DAT sent (fact)

'John sent a letter of encouragement to the man who is depressed'

Head-internal relative clauses cannot occur in adjunct position either, as illustrated in (5).

(5) ?*[oyu-ga nitatteiru no]-de sore-o tsukutta
hot water-NOM boiling -with it-ACC made

'(I) made it with boiling water'

In order to account for these distributional restrictions, I will appeal to the ECP. First, I will argue that head-internal relative clauses have an empty external head, as diagrammed in (6).

(6) $[_{NP}[[_{IP}[_{NP}$doroboo-ga$][_{VP}$detekita$]]$ no$][_{NP}e]]$
thief-NOM came out

I suggest that the ECP should be formulated so as to include (7). Then, the empty head of a head-internal relative clause is subject to the ECP. (See Jaegli (1982, 1985) and Stowell (1986) among others for "head government".)

(7) a. An empty head (X^0) must be properly governed.
b. An empty head (X^0) must be lexically governed to be properly governed.

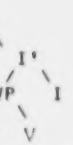
The definitions of government and proper government I assume here are given in (8) and (9).

(8) α governs β if every maximal projection dominating α also dominates β and conversely.
(Aoun and Sportiche 1983)

(9) α properly governs β if α governs β and
a. α is a lexical category X^0 (lexical government), or
b. α is coindexed with β (antecedent government).
(Cf. Chomsky 1981, Aoun and Sportiche 1983)

I will also assume that if α governs a phrasal category, it also governs its head (as in Belletti and Rizzi (1981)). Notice that the distributional restrictions mentioned above (namely, that head-internal relatives can only appear in the direct object position of a verb) will follow immediately from these assumptions, because only the object position of a verb (and the head of that object NP) is lexically governed. For ease of exposition, I will assume the following clausal structure in (10) for Japanese.[3]

(10)



In (2), repeated below as (2') with a more articulated structure, the empty head is lexically governed, thus properly governed, by the verb, satisfying (7).

(2')a. keikan-ga [$_{VP}$[$_{NP}$[doroboo-ga heya-kara detekita] no
policeman-NOM thief-NOM room-from came out

[$_{N}$e]]-o [$_{V}$taihoshita]] (koto)
-ACC arrested (fact)

'The policeman arrested the thief who came out of the room'

b. keikan-ga [$_{VP}$[$_{NP}$[doroboo-ga heya-kara detekita] no
policeman-NOM thief-NOM room-from came out

[$_{N}$e]]-ni [$_{V}$butsukatta]] (koto)
-DAT bumped into (fact)

'The policeman bumped into the thief that came out of the room'

In (3), where the head-internal relative occurs in subject position, the empty head is not lexically governed, violating (7), since there is no lexical governor of the empty head of a head-internal relative in subject position.[6] The verb does not lexically govern the subject position. In (4), the head-internal relative appears as indirect object. Given the fact that (4) is ungrammatical, I conclude that the indirect object marker *ni* is a postposition and that postpositions are not lexical governors in Japanese. (4) will then fail to satisfy (7) because the empty head will not be lexically governed. (5) can be accounted for similarly: *de* is a postposition and, as such, not a lexical governor. Therefore, the empty head is not lexically governed.

In Lasnik and Saito (1984, forthcoming), the ECP is assumed to apply both at S-structure and at LF. If (7) is part of the ECP, it should apply in the same way. In Section 3, I will argue that the empty head will be replaced by I(nfl) in LF, thus making the ECP irrelevant at LF. Then, if the ECP is responsible for the distributional restrictions of head-internal relatives, it should apply at S-structure. Let us consider this issue further here.

Consider (11), where the object NP (accusative or dative) is scrambled to the front of the sentence. (11a) is a scrambled version of (2a) and (11b) a scrambled version of (2b).

(11) a. [doroboo-ga heya-kara detekita no e]$_i$-o [keikan-ga
thief-NOM room-from came out -ACC policeman-NOM

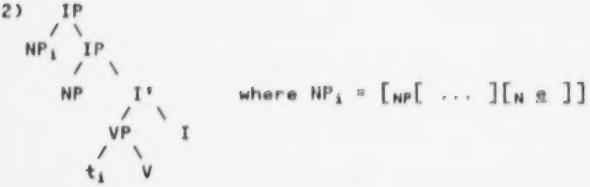
t_i taiho-shita] koto
arrested (fact)

b. [doroboo-ga heya-kara detekita no e]$_i$-ni [keikan-ga
thief-NOM room-from came out -DAT policeman-NOM

t_i butsukatta] (koto)
bumped into (fact)

These sentences are acceptable. At S-structure, after the object NP is scrambled, its empty head is not in a position to be lexically governed by the verb, as diagrammed in (12) below. (I assume here with Saito (1985) that scrambling in Japanese is adjunction to S (= IP).)

(12)



One might think of a possibility of applying (7) 'anywhere' so that the empty head can be licensed if it obeys (7) at D-structure. This, however, will not work, because the head-internal relative clause cannot occur in the subject position of a passive sentence either, as can be seen in (13).

(13)?*[doroboo-ga heya-kara detekita no e]-ga taiho-sareta (koto)
thief-NOM room-from came out -NOM was arrested (fact)

'The thief who came out of the room was arrested'

The D-structure of (13) would be (13'), where the head-internal relative is in the object position of the verb and its empty head is lexically governed by the verb, satisfying (7).

(13') [$_{VP}$[$_{NP}$[doroboo-ga heya-kara detekita no][$_N$e]][$_V$taihoshita]]
thief-NOM room-from came out arrested

The sentence, however, is unacceptable. Thus, we do not want (7) to license the empty head at D-structure, because (13) would then incorrectly be predicted to be grammatical.

We also cannot simply say that head-internal relatives cannot be assigned nominative Case and that the account of their distributional restrictions has nothing to do with government. Consider (14).

(14) kimi-ni [tori-ga sora-o tondeiru no e]-ga uchiotoseru ka
you-DAT bird-NOM sky-ACC is flying -NOM can shoot Q

'Can you shoot a bird which is flying in the sky?'

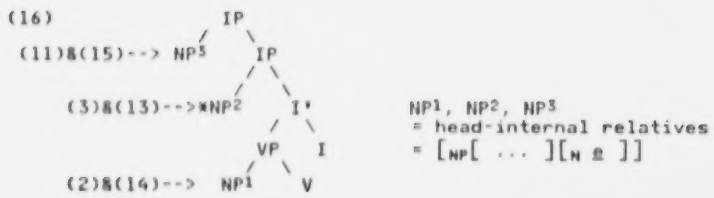
This is a construction with dative subject and nominative object. I will assume, contra Saito (1982, 1983, 1985), that in (14) the head-internal relative is in the object position of a verb structurally (like NP with accusative Case) but receives nominative Case (like subject NP), as has been suggested by Kuno (1973) and many others. Notice that if the relative clause is scrambled as in (15), the result is still as acceptable as the non-scrambled version in (14).

(15) [tori-ga sora-o tondeiru no e]$_i$-ga kimi-ni t_i
bird-NOM sky-ACC was flying -NOM you-DAT

uchiotoseru ka?
can shoot Q

Recall that in (11) the scrambling of head-internal relatives with accusative and dative Case did not alter the grammaticality of the sentences. The same seems to be true of the scrambling of head-internal relatives with nominative Case assigned by a verb.

The situation can now be summarized in the diagram in (16).



Thus, we would have to say that the heads of NP^1 and NP^3 are lexically governed but the head of NP^2 is not. What does this situation imply for the definition of the ECP?

Before we explore further details, let us turn to another example of government of an empty head.[5] Stowell (1981) suggests that when an embedded S′ occurs without an overt complementizer, as illustrated in (17), there is an empty category in the position of the complementizer, and that this empty category is subject to the ECP. If we assume that S′ is a projection of Comp, then the empty category will be the empty head of S′, another example of an empty head which obeys the ECP.

(17) Mary thinks [$_{S'}$ e [$_{S}$ John is a fool]]

This will predict that an S′ without a complementizer can only occur in a properly governed position. This is in fact the case, as can be seen in (18), where the subject is not properly governed position.

(18) *[$_{S'}$ e [$_{S}$ John is a fool]] is obvious

It is pointed out in Saito (1984, 1986) that a similar phenomenon can be found in the Kobe Dialect of Japanese. Consider the following example (19), where the complementizer *te* is optional.

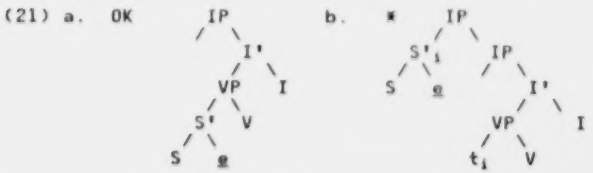
(19) John-ga [$_{S'}$[$_{S}$ Koobe-ni iku] (te)] yuuteta
John-NOM Kobe-to go COMP said

'John said that he was going to Kobe'

Now notice that if the S′ without a complementizer is scrambled, the sentence becomes unacceptable, as in (20), contrary to the case of head-internal relatives.

(20) *[$_{S'}$[$_{S}$ Koobe-ni iku] e] John-ga yuuta

The situation can be diagrammed as (21). Compare this with (16).



To sum up, a head-internal relative can be scrambled, but a complementizerless S′ cannot, though both of them have an empty head. The crucial difference between a complementizerless S′ and a head-internal relative is that a head-internal relative, being an NP as a whole, has a Case-particle, which may serve as a lexical governor. Then, both of these paradigms imply (22) and (23), along with (7).[6]

(7) a. An empty head (X^0) must be properly governed.
b. An empty head (X^0) must be lexically governed to be properly governed.

(22) Nominative Case on the subject is inherent in that it is not assigned by any element like INFL.
(Cf. Saito 1982, 1983, 1985)

(23) A Case particle can be a lexical governor iff it is assigned via a lexical governor.

Let us go back to head-internal relative clauses. The empty head of a head-internal relative in object position (either accusative, dative or nominative), as illustrated in (2) and (14), will then be lexically governed (thus, properly governed) at S-structure either by a Case particle or by a verb. (Notice that by (23) the nominative Case particle *ga* in (14) can be a lexical governor in this case because it is assigned by the verb, not being the default Case.) This explains the grammaticality of (2) and (14). In the case of the head-internal relative scrambled from object position, as in (11) and (15), its empty head is not lexically governed by a verb at S-structure, because the NP is outside of VP at S-structure, as diagrammed in (12) and (16). However, the head of the scrambled NP is lexically governed by a Case particle which is assigned by a verb, and therefore a lexical governor, because of (23). Thus, the empty head is properly governed, satisfying (7). This accounts for the grammaticality of (11) and (15). The empty head of the head-internal relative in subject position, as illustrated in (3) and (13), is not lexically governed by a verb. Nor is it lexically governed by the Case particle *ga*, because this *ga* cannot be a lexical governor since it is not assigned by a verb. Therefore, the empty head of a head-internal relative in the subject position is not properly governed. This takes care of the ungrammaticality of (3) and (13). (4) and (5), repeated below, are ruled out because the postpositions *ni* and *de* are not lexical governors, as we have already seen.

(4) *John-ga hagemashi-no tegami-o [otoko-ga ochikondeiru
John-NOM encouragement-GEN letter-ACC man-NOM depressed

no e]-ni okutta (koto)
-DAT sent (fact)

'John sent a letter of encouragement to the man who is depressed'

(5) *[oyu-ga nitatteiru no e]-de sore-o tsukutta
hot water-NOM boiling -with it-ACC made

'(I) made it with boiling water'

In the case of a complementizerless S', there is no Case particle because it is not an NP. Thus, the option of proper government by a Case particle is not available here. Thus, if it is to be properly governed, it has to be properly governed by a verb. Therefore, if it is scrambled, being moved outside of VP, it will not be governed by a verb at S-structure. This will explain the ungrammaticality of (20).

3. Accessibility of NP to Head-Internal Relativization

Let us consider the internal restrictions of a head-internal relative clause. Compared with normal "relativization", head-internal relativization in Japanese has severe restrictions on which NPs are accessible to relativization. First, a subject NP can be relativized, as illustrated in (24). (All relativized NPs are underlined below.)

(24) keikan-ga [doroboo-ga heya-kara detekita no]-o
policeman-NOM thief-NOM room-from came out -ACC

taiho-shita (koto)
arrested (fact)

'The policeman arrested the thief who came out of the room'

Relativization of accusative object NP is not so good. This is illustrated in (25).[7]

(25) ??keikan-ga [otoko-ga kodomo-o ijimete-iru no]-o
policeman-NOM man-NOM child-ACC teasing -ACC

hogo-shita (koto)
saved (fact)

'The policeman saved the child whom a man was teasing'

Dative direct object NP cannot be relativized, as shown in (26).

(26) *keikan-ga [otoko-ga kodomo-ni hanashikaketa no]-o
policeman-NOM man-NOM child-DAT talked -ACC

hogo-shita (koto)
saved (fact)

'The policeman saved the child to whom a man talked'

Relativization of an indirect object results in ungrammaticality, as exemplified in (27).

(27) *keikan-ga [mishiranu otoko-ga kodomo-ni
policeman-NOM strange man-NOM child-DAT

omocha-o ataeteiru no]-o hogo-shita (koto)
toy-ACC was giving -ACC saved (fact)

'The policeman saved the child to whom a strange man was giving a toy'

A genitive NP cannot be relativized, as can be seen in (28).

(28) *keikan-ga [sono doroboo-no kuruma-ga totsuzen
policeman-NOM that thief-GEN car-NOM suddenly

panku-shita no]-o taiho-shita (koto)
got a flat tire -ACC arrested (fact)

'The policeman arrested the thief whose car suddenly got a flat tire'

An adjunct cannot be relativized, as illustrated in (29).

(29) *watashi-ga [John-ga sono naifu-de ninjin-o
I-NOM John-NOM that knife-with carrot-ACC

kitteiru no]-o toriageta (koto)
was cutting -ACC took away (fact)

'I took away the knife with which John was cutting the carrot'

Head-internal relativization is clause-bound, as illustrated in (30).

(30) *keikan-ga [hitobito-ga [kodomo-ga shinikakatteiru to]
policeman-NOM people-NOM child-NOM is dying COMP

itteita no]-o hogoshita (koto)
was saying -ACC saved (fact)

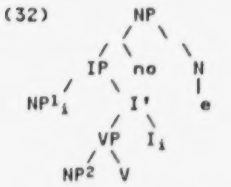
'The policeman saved the child who people were saying was about to die'

Ignoring the fact that relativization of an object is not totally ungrammatical (though it is degraded), I will assume that in head-internal relatives only the subject NP can be "relativized" and relativization is always clause-bound. Based on these facts, I will argue for (31).

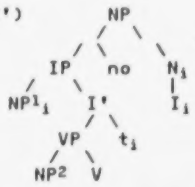
(31) a. There is SPEC-head agreement in IP. (Cf. Chomsky 1986)
b. I can move to N (X^0 movement).

(31) explains why only the subject NP can be 'relativized' and why the relationship is clause-bound. Subject NP and I(nflection) agree but object NP and I(nflection) never agree. Moreover, agreement is always clause-bound, as far as I know. If we assume that there is SPEC-head agreement in IP ((31a)), then the subject NP (NP^1 in (32)) and I will be coindexed, as diagrammed in (32).

(32)



(32')



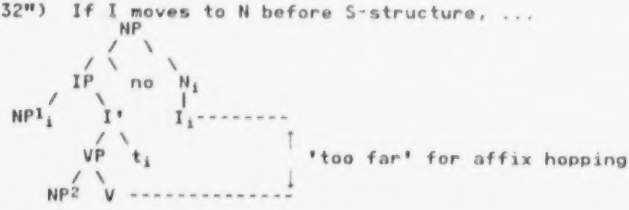
Now, since there is nothing wrong in moving I into N (because N is empty and available as a landing site for X^0 movement), I can move to N (in LF). N then will be coindexed with I. Transitively, N will be coindexed with NP^1. This is diagrammed in (32') above.

Now, let us consider the consequence of this movement. Notice that in head-internal relatives, the semantic selection of a verb is not satisfied straightforwardly. Let us take (1) as an example. The verb *taiho-suru* 'arrest' is specified in the lexicon as taking NP as its object. This "categorial" selection (c-selection) is satisfied at every level of representation. *Arrest* is also specified in the lexicon as taking as its object some entity you can arrest. In head-internal relative clauses, this "semantic" selection (s-selection) is not satisfied so straightforwardly because what is arrested (i.e., the semantic object of *arrest*) is inside the clause and is not realized as the head of the relative syntactically. Recall that semantic selection is usually realized as a head-to-head relation. In the case of head-internal relatives, the syntactic head (N) is empty at S-structure and the real semantic head is inside the clause. In other words, the s-selection relation does not exhibit a head-to-head relation. I will argue that I is moved into N in order to satisfy the s-selection (in LF) via coindexing. More specifically I will propose that indexing can transmit the features relevant for the s-selection.

Now, if the account I discussed in the previous section is correct, (31b) must apply in LF, but not in Syntax. Otherwise, the head would not be empty at S-structure and the ECP account of the distribution I discussed in the previous section would be void. However, movement of I to N in Syntax will be blocked for an independent reason, if we assume affix hopping (rather than V raising). If movement of I to N takes place in Syntax, then I will be "too far" from V for affix hopping to take place in PF: I will not be

"adjacent" to V any longer. It has been observed that the inflectional element must be adjacent to the verb, or Affix Hopping will be blocked. This is diagrammed in (32").

(32") If I moves to N before S-structure, ...



If Affix Hopping is blocked, an inflectional affix will be left stranded in N, as in (33), and will be ruled out by a general morphological filter like (34).

(33) *keikan-ga [doroboo-ga heya-kara deteki no ta]-o
policeman-NOM thief-NOM room-from come out PAST -ACC

taiho-shita (koto)
arrested (fact)

(34) A morphologically realized affix must be a syntactic dependent at surface structure. (Lasnik 1981)

Finally, notice the fact that quantifiers cannot be "relativized" head-internally. Consider (35).

(35) keisatsu-ga [takusan-no gakusei-ga nusumi-o
police-NOM many students-NOM stealing-ACC

hataraiteita no]-o taiho-shita (koto)
were doing -ACC arrested (fact)

'The police arrested a group of students who were stealing things'

In (35), *takusan* ('many') can only have a group reading, namely 'the police arrested a group of students who were stealing things at the same time'. In head-external relative clauses, besides the group reading, as in (36a) below, the distributive reading, as in (36b) below, is available.

(36) keisatsu-ga [[nusumi-o hataraiteita] takusan-no
police-NOM stealing-ACC were doing many

gakusei]-o taiho-shita (koto)
students-ACC arrested (fact)

a. 'The police arrested a group of students who were stealing things'
b. 'There were many students who were stealing things (individually). The police arrested them (individually)'

In the case of head-internal relative clauses, the "relativized" NP does not move, but rather stays inside the lower clause IP at S-structure, as diagrammed in (32) and (32'). Quantifier Raising (QR) cannot raise a quantifier from the SPEC of IP to the matrix clause, because QR is clause-bound, as pointed out by May (1977). Therefore, the head of a head-internal

relative has no quantificational force. For head-external relatives, on the other hand, the head is already outside IP at S-structure, no matter how head-external relatives are derived. Therefore, QR can raise a quantified head (probably with the relative clause) and adjoin it to the matrix clause, yielding a distributional reading in (36).

4. Concluding Remarks

This paper has been an attempt to account for the distributional restrictions of Japanese head-internal relative clauses and the restrictions on accessibility of NP to head-internal relativization in terms of the Empty Category Principle (ECP), SPEC-head agreement in IP, and LF X^0 movement. Though further research has to be done for a more detailed account of the issue, to the extent that the present analysis has captured some significant generalizations of head-internal relatives in Japanese, it has provided support for the existence of these principles.

FOOTNOTES

* I am grateful to Mona Anderson, Noriko Kawasaki, Howard Lasnik, Diane Lillo-Martin, Mamoru Saito, Robyne Tiedeman for their comments and suggestions. This paper is part of Ishii (1988), which discusses head-internal relative clauses in Japanese in more detail.

1. There is another type of head-internal relative, as illustrated in (i).

```
(i) keikan-ga     [doroboo-ga heya-kara detekita tokoro]-o
    policeman-NOM  thief-NOM  room-from came out        -ACC

    taihoshita (koto)
    arrested   (fact)    (tokoro 'point in time')

    'The policeman arrested the thief who came out of the room'
    'The policeman arrested the thief_i while he_i came out of
    the room'
```

Though I won't get into the details here, this type of head-internal relative clause is very different from the type illustrated in (1) in the text. For example, the former is much freer in accessibility of relativization than the latter. In this paper, I will focus on head-internal relative clauses illustrated in (1) in the text.

2. For previous works on head-internal relative clauses in Japanese, see Kuroda (1974, 1975-76, 1976-77) and Ito (1986). For the *tokoro* phrase, see Hale and Kitagawa (1976-77), Harada (1973), Josephs (1976), Kuroda (1976-77, 1978). For head-internal relatives in other languages, see Platero (1974) for Navajo, Cole (1987) for Quechua, and Williamson (1987) for Lakhota. For a pragmatic constraint on head-internal relatives in Japanese, see Kuroda (1975-76).

3. It has been claimed (in e.g. Fukui (1986) and Lasnik and Saito (forthcoming)), however, that Japanese has a VP-internal subject. Since this is orthogonal to the present discussion, I will not assume it here. The point I have made in this paper still holds even if we employ the VP-internal subject hypothesis for Japanese. See Ishii (1988) for more discussion on this issue.

4. For more discussion on the proper government of the subject position and its head in Japanese, see Ishii (1988).

5. Thanks are due to Howard Lasnik and Mamoru Saito for bringing this to my attention.

6. (23) is still stipulative. It may be the case that some properties of lexical government are transmitted from the verb to the Case particle.

7. The following examples from Kuroda (1975-76) might suggest that relativization of object NP is possible. ((i) is ambiguous: it can mean (a) or (b). In the case of (b), the object NP is relativized.)

```
(i)    sono omawari-wa [gakusei-tachi-ga CIA-no  supai-o
       the  cop-TOPIC   students-NOM     CIA-GEN spy-ACC

       kumihuseta no]-o   uchi-korosita
       hold down     -ACC shot-and-killed

   (a) 'The cop shot and killed the students who held down the CIA
       spy'
   (b) 'The cop shot and killed the CIA spy who the students held
       down'

(ii)   wareware-wa [ryooshi-tachi-ga sakana-o hune-de
       we-TOPIC     fishermen-NOM    fish-ACC boat-with

       oikonde-kita no]-o   teiboo-no      ue-kara tsutta
       drove-in        -ACC embarkment-GEN on from fished

       'We fished on the embarkment for the fish which fishermen
       drove in with boats'
```

I find these sentences (with the relevant readings) slightly degraded. In addition, I conjecture that this type of relative is different from the type I have discussed in the text. It seems that there is a derogatory connotation to the referent of the head and that it conflicts with an honorific marking on the verb, as illustrated below.

```
(iii)?*John-ga  [Mary-ga  sensei-o     o-yobi-shita no]-o
       John-NOM  Mary-NOM teacher-ACC  call(Obj-Hon)   -ACC

       nagutta (koto)
       hit     (fact)     (Obj-Hon = Object Honorification)

       'John hit the teacher who Mary called'
```

There is no such restriction in the case of the head-internal relative in which the subject NP is relativized, as the following grammatical example from Ito (1986) illustrates. (See also Kuroda (1976-77).)

```
(iv)  [sensei-ga   kenkyuushitsu-kara dete-irasshatta   no]-ni
       teacher-NOM office-from        out  came(Subj-Hon)  -DAT

       guuzen       deaisuru-koto-ga dekita
       accidentally meet(Obj-Hon)    able-past
                    (Subj-Hon = Subject Honorification)
       'I happened to be able to meet the teacher who was coming
       out of his office'
```

Since the status of these sentences is not clear, I will exclude them from my discussion.

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